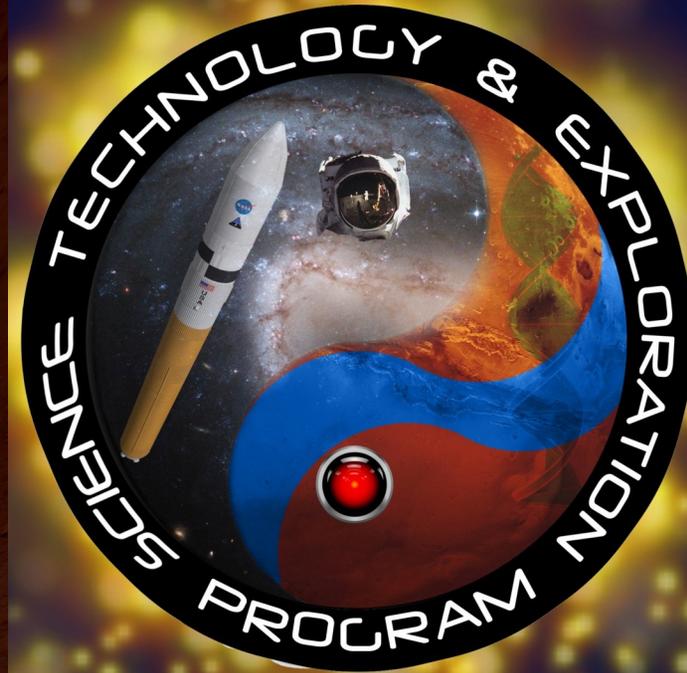


# STEP 2011

*A Student Mission to Mars*



## Science, Technology And Exploration Program

Science Summer Camp for High School Students

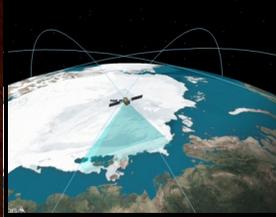
*supported by*

NASA Ames Research Center  
 NASA Science Mission Directorate  
 Advanced Studies Laboratory  
 Ames Contractor Council  
 Lockheed Martin Corporation

**JUNE 10-26, 2011**

### Computer Simulations

Students will be introduced to computer simulations that aid in the exploration of our solar system. In a series of engaging activities, students will learn to use the Satellite Tool Kit Astrodynamics software, navigate their way around Mars with Google Mars, and watch fascinating computer-simulated movies including Entry, Descent and Landing, a flight into Mariner Valley (Mars) and others.



### Leadership and Teamwork

Leadership and teamwork activities in STEP are designed to stimulate social interactions between students, engaging their participation and enhancing their collaboration skills. Students will learn about international cooperation between leading world space programs, work as teams, and prepare and present a final team project.



### Camp Structure

There is no cost for students to attend STEP. The dates of this year's two-week program at NASA Ames Research Center (Moffett Field) are from June 10 – 26, from 8am – 5pm daily. Students will work in teams of four, each team being mentored by a teacher from a participating school. A field trip to Lassen Volcanic National Park is scheduled for June 18 - 20, with transportation, lodging, and meal costs completely covered by the program. On the last weekend of the camp, a rocket launching event, robotics competition, and final presentation with a farewell barbeque will be given by the students to their families.

### Who Should Apply

All students who are interested in NASA and space exploration should apply to STEP. Contact the teacher liaison at your high school who is in charge of recruiting. Four students will be selected from each participating high school. For more information, contact Oana Marcu at [Oana.Marcu@nasa.gov](mailto:Oana.Marcu@nasa.gov) or visit <http://microbes.arc.nasa.gov/STEP> or <http://tinyurl.com/NASASTEP2010>

**June 2011**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

*"I believe it is a life path changing experience. The exposure sparked so many career possibilities for her." —Student Participant's Parent*

*"This has been the most enriching program I have attended in my 12 years as a teacher" —Teacher Participant*

# SCIENCE TECHNOLOGY & EXPLORATION PROGRAM 2011

## What is STEP?

The NASA Science, Technology and Exploration Program (NASA STEP) provides two weeks of informal education, designed to share and inspire the possibilities of space exploration. The central theme of the camp is the development of a robotic mission to Mars to search for life. Leveraging the expertise and infrastructure at the NASA Ames Research Center at Moffett Field, STEP uses the fascinating field of astrobiology to give students and teachers exposure to a diverse range of space-related disciplines and access to current space research and discoveries.

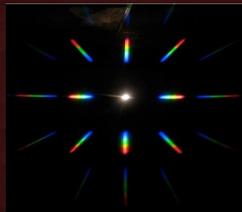
Astrobiology, the study of the origin, evolution and distribution of life in our universe, brings together all aspects of space exploration, science and engineering. It is a multidisciplinary field based on physics, chemistry, biology, and geology. Astrobiology exploration on Earth (often in extreme environments) and in space involves robotics, advanced engineering, and state-of-the-art instrumentation.

NASA STEP consists of a series of science and engineering discovery lectures, hands-on exploration activities and local and virtual field trips. The program, designed around a "mission-building" concept to search for traces of life on Mars, emphasizes collaboration and teamwork, and offers direct interaction with space scientists and engineers. Students will experience what it is like to be involved in groundbreaking investigations and associated fieldwork at NASA's Ames Research Center.

*"This program was amazing. It really showed me what I am interested in and what I want to focus on."*  
—Student Participant

## Discovery Lectures

The discovery lectures are designed to provide participants with the background information they will need to understand the relevant science and engineering required to engage in the main theme of the camp.



The lectures are given by scientists and engineers who are experts in their fields, and cover a range of topics from astrochemistry and evolutionary biology to rocketry and robotics. Since the program is manageably small, the presentations are highly interactive, offering the best possible introduction to the material.

## Hands-On Science Labs

The hands-on science labs introduce students to laboratory work and techniques that are used in the study of life. Examples of the type of activities that are done include a workshop in microbial mats, culturing extremophiles, fundamentals of microscopy, and DNA isolation and protein absorbance.



*"The STEP camp showed me that I want to be around NASA as much as possible. I am currently applying for an Ames Associate volunteer position."*  
—Student Participant

*"This program didn't only give me knowledge but also built my confidence and experience..."*  
—Student Participant

## Rocketry and Robotics

Students study the dynamics of flight and challenges of robotics through a series of workshops where they build and fly their own model rockets with payloads systems of their own design, and construct and program robots for a friendly, good-spirited competition.



## Lassen Volcanic National Park

An important component of studying and understanding the limits of life and life's survival strategies is field work. Students will travel to Lassen Volcanic National Park for a three-night, four-day adventure where they will see life thriving in boiling mud pots adjacent to snow algae living on ice, explore a cave, and see a unique volcanic landscape reminiscent of Mars.



*"STEP gives students the opportunity to move forward, choose a right direction in their career, and create a new future."* —Student Participant